CLAIMS

What is claimed is:

1. A method of navigating data blocks, comprising:

opening a first data block of a plurality of data blocks of interest, said

plurality of data blocks being spatially indexed in N dimensions;

viewing a closeness relationship between said first data block opened

and a second plurality of data blocks based on their content; and

accessing a second data block of said second plurality of data blocks

which is viewed to be closest to said first data block.

2. The method of claim 1, wherein a user views said first data block and

views its relationship with other data blocks based on a calculation of a

distance function, and without traversing a hypertext link, and without

subsequently accessing a prior search results page.

3. The method of claim 1, further comprising:

each time a data block is accessed, building a proximity list indicating

a closeness of another plurality of data blocks to the data block accessed

currently, such that the user traverses data blocks horizontally to find a most

relevant data block to information sought.

4. The method of claim 1, wherein N is a number of words or subjects in a selected corpus.

5. The method of claim 1, further comprising:

    inputting, by a user, an input indicating a search to be performed, the

5   input including a collection of data blocks which are to be indexed, said data

blocks selectively containing data, metadata, and links to other data blocks.

6. The method of claim 5, wherein the user further inputs a search depth

defining how many links are to be followed during a search process and a

collection of text strings 1 to N is input, said text strings being used as search

10   criteria in a spatial indexing process.

7. The method of claim 6, further comprising:

    creating, for each data block given as an input, an index record for

storing search results which relate each said data block to each of the strings in

the collection; and

15   creating a global index record array which contains index records for

each of the data blocks given as an input.

8. The method of claim 7, wherein said indexing of the data blocks includes:

    determining whether an index record i is less than a number M of

blocks in the database and if so setting a number j to 0;

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determining whether j is less than the number N of keywords in a search corpus, and if so, calculating a search result Rj as a number of occurrences of word Wj in the data block B(i);

storing the search result Rj in the index of block B(i); and

5   incrementing j by "1" and determining whether j is less than N.

9. The method of claim 8, further comprising:

if j is determined to be less than N, incrementing the index record i and determining whether i is less than the number M of blocks in the database.

10. The method of claim 9, further comprising:

10   if i is not less than M, then storing a vector R() in the index of each block B(i) as a spatial coordinate of each document Bi.

11. The method of claim 1, further comprising:

calculating and displaying a proximity list for a data block.

12. The method of claim 11, said calculating comprising:

15   reading an input data block B(c);

reading search results R1 to Rn stored in the index in block B;

setting i to "1", and determining whether i is less than a number M of blocks in the database and if so, setting j to 1 and a distance to 0;

determining whether j is less than a number N of key words in a search

20   corpus, and if so incrementing the distance to a sum of a previous distance and

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an absolute value of a difference between a result Rj of block Bc and the result

Rj of block Bj, and incrementing j.

13. The method of claim 12, further comprising:

if j is determined to be not less than N, then incrementing i and again

5   determining if i is less than M.

14. The method of claim 12, further comprising:

if it is determined that i is not less than M, then building a proximity

list by listing the data blocks B(i) wherein 0<i<M by ascending order

according to a value of distance (i), thereby to calculate the proximity list for

10   the data block.

15. The method of claim 1, further comprising:

positioning, by the user, a search focus and directing coordinates of a

search.

16. The method of claim 1, further comprising:

15   providing a graphical user interface which shows a projection of the N-

dimensional space into a plurality of dimensions.

17. The method of claim 16, further comprising:

displaying the projection in three dimensions obtained by first

selecting all data blocks in the space which have a non-zero value for

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coordinates (x, y, z), where x, y, and z are search criteria, and then by making a value of all other coordinates equal to zero.

18. The method of claim 17, further comprising:

displaying search results in a scatter-plot, thereby to reveal a geometric solid with dense and sparse areas, such that the solid is oriented in the three axes, and points which are at the center are related to all three subjects and such that points with a relatively high value in one axis, and relatively low values in the remaining axes will contain data blocks which are relevant only to the term relevant to the one axis, but not to terms relevant to the remaining axes.

19. The method of claim 18, wherein most significant Web pages are displayed in a most densely populated area that is not skewed towards any particular axis, and

wherein a current position of the search is shown in the scatter-plot, such that a user navigates documents in the scatter-plot using a hand-held input mechanism.

20. The method of claim 19, wherein said hand-held input mechanism comprises at least one of a mouse, a touchpad, a light pointer, a keyboard, and a joy stick.

21. The method of claim 19, further comprising:

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as the user navigates the three dimensional scatter-plot, changing a current position and a proximity list.

22. The method of claim 21, wherein, during a spatial search, the user positions the current position in a center of the most densely populated area.

5   23. The method of claim 1, wherein said data blocks comprise documents, said method further comprising:

selectively providing documents with or without any inter-document links.

10   24. A Graphical User Interface (GUI), comprising:

a display window; and

a retrieval object displayed on said display window for assisting a user in retrieving data which is spatially organized in N-dimensions and displaying said data on said window.

15   25. The Graphical User Interface (GUI) according to claim 24, wherein said data includes documents, and wherein said retrieval object includes means for controlling parameters of a search of said documents.

26. The Graphical User Interface (GUI) according to claim 25, wherein said retrieval object includes a Search criteria window for allowing said user to

20   enter search criteria, a proximity list listing documents which are closest to

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said document currently opened, a window indicating a researcher associated with the area of interest represented by a currently opened document and whether said researcher can be contacted, a message window, and a Trails window.

5   27. The Graphical User Interface (GUI) according to claim 24, wherein said retrieval object comprises a graphical facility for guiding a researcher into navigation and retrieval of documents in the World Wide Web (WWW).

28. The Graphical User Interface (GUI) according to claim 24, wherein said retrieval object includes a window indicating a spatial navigation tool 10   indicating a number of navigational dimensions, a window showing a three-dimensional projection of a search space to allow the user to visualize the search space the user currently resides, and a direction that the user's research is moving in the search.

29. The Graphical User Interface (GUI) according to claim 28, wherein the 15   retrieval object allows for correlating the user's actions with responses from previous users in a system, and is adaptive to the user to guide the user to appropriate information.

30. A graphical Web browsing interface for spatial data navigation, comprising:

a retrieval object displayed on a display window for assisting a user in

retrieving data which is spatially organized in N-dimensions and displaying

said data on said window.

31. A signal-bearing medium tangibly embodying a program of machine-

readable instructions executable by a digital processing apparatus to perform a

method of navigating documents, said method comprising:

opening a first document of a plurality of documents of interest, said

plurality of documents being spatially indexed in N dimensions;

viewing a closeness relationship between said first document opened

and a second plurality of documents based on their content; and

accessing a second document of said second plurality of documents

which is viewed to be closest to said first document.